UNITED STATES PATENT AND TRADEMARK OFFICE

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EXAMINER
STACE, BRENT S

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/674,676	NAJORK ET AL.
	Examiner	Art Unit	
	Brent S. Stace	2161	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>28 March 2007</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1,2,4-12,14-30,32-38 and 40-56</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1,2,4-12,14-30,32-38 and 40-56</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>30 June 2006</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Remarks

1. This communication is responsive to the amendment filed March 28th, 2007.

Claims 1, 2, 4-12, 14-30, 32-38, and 40-56 are pending. In the amendment filed March

28th, 2007, Claims 1, 10, 12, 20, 22, 27, 29, 38, 46, 51, 53, and 55 are amended, and

Claims 1, 12, 22, 29, 38, 46, 51, 53, and 55 are independent. The examiner

acknowledges that no new matter was introduced.

2. A request for continued examination under 37 CFR 1.114, including the fee set

forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this

application is eligible for continued examination under 37 CFR 1.114, and the fee set

forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action

has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March

28th, 2007 has been entered.

Response to Arguments

3. The Applicant's arguments filed March 28th, 2007 with respect to Claims 1, 2, 4-

12, 14-30, 32-38, and 40-56 have been considered but are not persuasive.

4. As to the applicant's arguments with respect to Claims 1, 12, 22, 29, 38, 46, 51,

53, and 55 for the prior art(s) allegedly not teaching "wherein said at least one entry

from said allocation layer is local to its corresponding computing device of a plurality of

computing devices and said at least one entry from said B-link tree is replicated among

said plurality of computing devices," the examiner respectfully disagrees. Lomet, col. 2,

lines 50-53 with Lomet, col. 5, lines 51-62 with Lomet, col. 2, lines 11-16 were used in

rejecting these limitations. Lomet, col. 2, lines 50-53 with Lomet, col. 5, lines 51-62

teaches that the RLOGs can be made individually for each node (private/local) where a

separate RLOG is associated with each node. Alternatively, nodes can also share

RLOGs or each node can have multiple RLOGs. Lomet, col. 2, lines 11-16 teaches that

data of a database (such as data in the B-link tree of Lehman) in Lomet can be

distributed where "the same data can reside in the local memories of multiple nodes and

can be updated from these nodes." The same data residing in multiple nodes means

that replication of the data occurred in some fashion. In the database art, distributing

data across systems improves availability since multiple copies of the same data exist

across different servers/nodes.

5.   The other claims argued merely because of a dependency on a previously

argued claim(s) in the arguments presented to the examiner, filed March 28th, 2007, are

moot in view of the examiner's interpretation of the claims and art and are still

considered rejected based on their respective rejections from a prior Office action (parts

of recited again below).

Specification

6.   The lengthy specification has not been checked to the extent necessary to

determine the presence of all possible minor errors. Applicant's cooperation is

requested in correcting any errors of which applicant may become aware in the

specification.

7.   The disclosure is objected to because of the following informalities:

a.   The specification is objected to as failing to provide proper antecedent

basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP

§ 608.01(o). Correction of the following is required: the claimed subject matter of

"after the data transaction commits" from Claim 8, 18, 36, and 44 must be

reflected in the specification. The examiner only sees support in the specification

for the hypothetical limitation of "before the data transaction commits" (see

paragraphs [0064]-[0067] of respective pages 20 and 21 of the present

application). Most database management systems store log records into a

persistent storage prior to committing a transaction so that the transaction for

commission is not lost (the transaction can be recovered) if/when there is a

system failure. Additionally, as exemplary Claim 8 is written now, the applicant's

representative <u>may wish to confirm with the client that this is what is intended to

be claimed</u> since logging a transaction after it has committed seems counter-

intuitive. In fact, the specification at paragraph [0064] (published paragraph

[0084]), says that in order to have an effective and reliable system for logging

(and recovery) the log entry for an operation to be committed must be written to

the log prior to the operation being committed. Therefore it appears the

Applicant is claiming a logging and recovery system that is not effective or

reliable (based on the Applicant's own specification).

Appropriate correction is required

Claim Rejections - 35 USC § 112

8. In light of the applicant's respective arguments or respective amendments, the previous 35 USC § 112 rejections to the claims have been withdrawn.

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 10, 11, 20, 21, 27, 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

11. Claims 10, 20, and 27 claim a computer readable medium of a method. These claims appear to claim two different statutory categories of invention, as such it is unclear what statutory category of invention these claims are claiming.

12. Claims 11, 21, and 28 claim a modulated data signal of a method. These claims appear to claim two different statutory categories of invention, as such it is unclear what statutory category of invention these claims are claiming.

Claim Rejections - 35 USC § 101

13. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

14.   In light of the applicant's respective arguments or respective amendments, the previous 35 U.S.C. 101 rejections to Claims 10, 20, and 27 have been withdrawn.

15.   Claims 11, 21, and 28 are still rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

16.   Claims 11, 21, and 28 are specifically modulated data signals and are non-statutory since they are not tangible. The applicant's stated that these claims were canceled to overcome the 35 USC § 101 rejections, however the status identifiers for the claims in the listing of claims and the remarks listing the pending claims do not match this statement.

Claim Rejections - 35 USC § 103

17.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

18.   This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g)

prior art under 35 U.S.C. 103(a).

19.   Claims 1, 2, 4-12, 14-21, 29, 30, 32-38, 40-45, and 51-54 are rejected under 35

U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,485,608 (Lomet et al.) in

view of "Efficient Locking for Concurrent Operations on B-Trees" (Lehman et al.).

For **Claim 1**, Lomet teaches: "A method for logging while updating…via a

plurality of data transactions, [Lomet, col. 7, lines 26-34] comprising:

- generating at least one log entry corresponding to a data transaction of the

  plurality of data transactions, the data transaction to be carried out on said B-link

  tree, [Lomet, col. 22, lines 25-30 with Lomet, col. 19, lines 35-37] wherein said at

  least one log entry includes at least one entry from an allocation layer [Lomet,

  col. 1, lines 65-67 with Lomet, col. 5, lines 38-44] and at least one entry from a B-

  link tree layer, [Lomet, col. 19, lines 35-37 with Lomet, col. 5, lines 38-44]

  wherein said at least one entry from said allocation layer is local to its

  corresponding computing device of a plurality of computing devices [Lomet, col.

  2, lines 50-53 with Lomet, col. 5, lines 51-62] and said at least one entry from

  said B-link tree is replicated among said plurality of computing devices; [Lomet,

  col. 2, lines 11-16] and

- storing said at least one log entry into a log" [Lomet, col. 19, lines 35-37].

  Lomet discloses the above limitations but does not expressly teach:

- "…a B-link tree."

With respect to Claim 1, an analogous art, Lehman, teaches:

- "...a B-link tree" [Lehman, p. 657, section 3.3].

It would have been obvious to one of ordinary skill in the art at the time of invention to combine Lehman with Lomet because both inventions are directed towards storing information in a database.

Lehman's invention would have been expected to successfully work well with Lomet's invention because both inventions use databases. Lomet discloses methods and an apparatus for updating information in a computer system using logs and state identifiers comprising Rlogs, Ulogs and Alogs, however Lomet does not expressly disclose the use of a B-link-tree to store the data in the database of Lomet. Lehman discloses efficient locking for concurrent operations on B-trees comprising a B-link-tree.

It would have been obvious to one of ordinary skill in the art at the time of invention to take the b-link-tree from Lehman and install it into the invention of Lomet, thereby offering the obvious advantage of a guaranteed small (average) search, insertion, and deletion time for the database of Lomet.

Claim 2 can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 1, further including periodically truncating the log" [Lomet, cols. 11-12, lines 60-12].

Claim 4 can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 1, further including discarding said at least one log entry from the log when the data transaction has been carried out on said B-link tree" [Lomet, col. 14, lines 9-12].

Claim 5 can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 1, wherein said storing includes storing said at least one log entry into the log before the data transaction is carried out on said B-link tree" [Lomet, col. 7, lines 26-34].

Claim 6 can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 1, further including caching data of said data transaction before said data transaction is carried out on said B-link tree" [Lomet, col. 7, lines 26-34 with Lomet, col. 5, lines 1-11].

Claim 7 can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 1, further including storing said at least one log entry in an intermediate memory previous to storing said at least one log entry in the log" [Lomet, col. 7, lines 26-34 with Lomet, col. 19, lines 35-37].

Claim 8 can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 7, wherein said at least one log entry is moved from intermediate memory to the log after the data transaction commits" [Lomet, col. 16, lines 23-25].

Claim 9 can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 1, further including maintaining a log sequence number with each of said at least one log entry, uniquely identifying said at least one log entry" [Lomet, col. 5, lines 44-52].

Claim 10 encompasses substantially the same scope of the invention as that of Claim 1, in addition to computer readable medium and some executable instructions for

performing the method steps of Claim 1. Therefore, Claim 10 is rejected for the same

reasons as stated above with respect to Claim 1.

Claim 11 encompasses substantially the same scope of the invention as that of

Claim 1, in addition to a modulated data signal and some executable instructions for

performing the method steps of Claim 1. Therefore, Claim 11 is rejected for the same

reasons as stated above with respect to Claim 1.

For **Claim 12**, Lomet teaches: "A method for logging while updating via a

plurality of data transactions, [Lomet, col. 7, lines 26-34] comprising:

- generating at least one log entry corresponding to a data transaction of the

    plurality of data transactions, the data transaction to be carried out on said B-link

    tree, [Lomet, col. 19, lines 35-37 with Lomet, col. 19, lines 45-51] wherein said at

    least one log entry includes at least one entry from an allocation layer [Lomet,

    col. 1, lines 65-67 with Lomet, col. 5, lines 38-44] and at least one entry from a B-

    link tree layer, [Lomet, col. 19, lines 35-37 with Lomet, col. 5, lines 38-44]

    wherein said at least one entry from said allocation layer is local to its

    corresponding computing device of a plurality of computing devices [Lomet, col.

    2, lines 50-53 with Lomet, col. 5, lines 51-62] and said at least one entry from

    said B-link tree is replicated among said plurality of computing devices; [Lomet,

    col. 2, lines 11-16]

- storing said at least one log entry into a finite log; [Lomet, col. 19, lines 45-51]

- periodically flushing data corresponding to data transactions represented by the

    finite log to persistent storage; [Lomet, col. 14, lines 9-17] and

- truncating said finite log in coordination with said flushing" [Lomet, col. 14, lines

  9-17].

  Lomet discloses the above limitations but does not expressly teach:

- "a B-link tree."

  With respect to Claim 12, an analogous art, Lehman, teaches:

- "a B-link tree" [Lehman, p. 657, section 3.3].

  It would have been obvious to one of ordinary skill in the art at the time of

invention to combine Lehman with Lomet because both inventions are directed towards

storing information in a database.

Lehman's invention would have been expected to successfully work well with

Lomet's invention because both inventions use databases. Lomet discloses methods

and an apparatus for updating information in a computer system using logs and state

identifiers comprising Rlogs, Ulogs and Alogs, however Lomet does not expressly

disclose the use of a B-link-tree to store the data in the database of Lomet. Lehman

discloses efficient locking for concurrent operations on B-trees comprising a B-link-tree.

It would have been obvious to one of ordinary skill in the art at the time of

invention to take the b-link-tree from Lehman and install it into the invention of Lomet,

thereby offering the obvious advantage of a guaranteed small (average) search,

insertion, and deletion time for the database of Lomet.

Claim 14 can be mapped to Lomet (as modified by Lehman) as follows: "A

method according to claim 12, further including discarding said at least one log entry

from the finite log when the data transaction has been carried out on said B-link tree" [Lomet, col. 14, lines 9-17].

Claim 15 can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 12, wherein said storing includes storing said at least one log entry into the finite log before the data transaction is carried out on said B-link tree" [Lomet, col. 7, lines 26-34].

Claim 16 can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 1, further including caching data of said data transaction before said data transaction is carried out on said B-link tree" [Lomet, col. 7, lines 26-34 with Lomet, col. 5, lines 1-11].

Claim 17 can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 12, further including storing said at least one log entry in an intermediate memory previous to storing said at least one log entry in the finite log" [Lomet, col. 7, lines 26-34 with Lomet, col. 19, lines 35-37].

Claim 18 can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 17, wherein said at least one log entry is moved from intermediate memory to the finite log after the data transaction commits" [Lomet, col. 16, lines 23-25].

Claim 19 can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 12, further including maintaining a log sequence number with each of said at least one log entry, uniquely identifying said at least one log entry" [Lomet, col. 5, lines 44-52].

Claim 20 encompasses substantially the same scope of the invention as that of Claim 12, in addition to computer readable medium and some executable instructions for performing the method steps of Claim 12. Therefore, Claim 20 is rejected for the same reasons as stated above with respect to Claim 12.

Claim 21 encompasses substantially the same scope of the invention as that of Claim 12, in addition to a modulated data signal and some executable instructions for performing the method steps of Claim 12. Therefore, Claim 21 is rejected for the same reasons as stated above with respect to Claim 12.

Claims 29 and 30 encompass substantially the same scope of the invention as that of Claims 1 and 2, respectfully, in addition to a server and some actions for performing the method steps of Claims 1 and 2, respectfully. Therefore, Claims 29 and 30 are rejected for the same reasons as stated above with respect to Claims 1 and 2, respectfully.

Claims 32-37 encompass substantially the same scope of the invention as that of Claims 4-9, respectfully, in addition to a server and some actions for performing the method steps of Claims 4-9, respectfully. Therefore, Claims 32-37 are rejected for the same reasons as stated above with respect to Claims 4-9, respectfully.

Claim 38 encompasses substantially the same scope of the invention as that of Claim 12, in addition to a server and some objects for performing the method steps of Claim 12. Therefore, Claim 38 is rejected for the same reasons as stated above with respect to Claim 12.

Claims 40-45 encompass substantially the same scope of the invention as that of Claims 14-19, respectfully, in addition to a server and some objects for performing the method steps of Claims 14-19, respectfully. Therefore, Claims 40-45 are rejected for the same reasons as stated above with respect to Claims 14-19, respectfully.

Claims 51 and 52 encompass substantially the same scope of the invention as that of Claims 1 and 2, respectfully, in addition to a computing device and some means for performing the method steps of Claims 1 and 2, respectfully. Therefore, Claims 51 and 52 are rejected for the same reasons as stated above with respect to Claims 1 and 2, respectfully.

Claims 53 and 54 encompass substantially the same scope of the invention as that of Claims 12 and 14, respectfully, in addition to a computing device and some means for performing the method steps of Claims 12 and 14, respectfully. Therefore, Claims 53 and 54 are rejected for the same reasons as stated above with respect to Claims 12 and 14, respectfully.

20.   Claims 22, 23, 26-28, 46, 47, 50, 55 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,485,608 (Lomet et al.) in view of U.S. Patent No. 5,434,994 (Shaheen et al.).

For **Claim 22**, Lomet teaches: "A method for logging while updating a data structure via a plurality of data transactions, [Lomet, col. 7, lines 26-34] comprising:

- generating at least one log entry corresponding to a data transaction of the plurality of data transactions, the data transaction to be carried out on said data structure; [Lomet, col. 22, lines 25-30 with Lomet, col. 19, lines 35-37] and

- where the log is partitioned into an upper layer and an allocation layer, [Lomet, col. 5, lines 31-45 with Lomet, Fig. 3] wherein the single log includes log entries from both the upper layer and allocation layer [Lomet, col. 5, lines 15-22 with Lomet, Fig. 3]

- ...wherein said at least one entry from said allocation layer is local to its corresponding computing device of a plurality of computing devices [Lomet, col. 2, lines 50-53 with Lomet, col. 5, lines 51-62] and said at least one entry from said B-link tree is replicated among said plurality of computing devices" [Lomet, col. 2, lines 11-16].

Lomet discloses the above limitations but does not expressly teach:

- "replicating updates to the data structure to a first server location and a second server location;

- maintaining a single log at each of said first and second server locations."

With respect to Claim 22, an analogous art, Shaheen, teaches:

- "replicating updates to the data structure to a first server location and a second server location; [Shaheen, col. 7, lines 50-55]

- maintaining a single log at each of said first and second server locations" [Shaheen, col. 4, lines 62-66].

It would have been obvious to one of ordinary skill in the art at the time of

invention to combine Shaheen with Lomet because both inventions are directed towards

recovering data upon failure.

Shaheen's invention would have been expected to successfully work well with

Lomet's invention because both inventions use computers using logs. Lomet discloses

methods and an apparatus for updating information in a computer system using logs

and state identifiers comprising Rlogs, Ulogs and Alogs, however Lomet does not

expressly disclose replicating data on multiple servers, or maintaining a single log on

those servers. Shaheen discloses a system and method for maintaining replicated data

coherency in a data processing system comprising replicating data and logs across

multiple servers.

It would have been obvious to one of ordinary skill in the art at the time of

invention to take the replication of data and logs across multiple servers from Shaheen

and install it into the invention of Lomet, thereby offering the obvious advantage of

making Lomet distributed to increase the availability and reliability of distributed systems

of Lomet.

Claim 23 can be mapped to Lomet (as modified by Shaheen) as follows: "A

method according to claim 22, further including recovering the data structure after a

failure by performing parallel recovery operations by each of said first and second

server locations" [Shaheen, col. 4, lines 60-66 with Shaheen, col. 7, lines 49-57].

Claim 26 can be mapped to Lomet (as modified by Shaheen) as follows: "A

method according to claim 22, wherein the allocater layer handles at least one of (A) an

allocate disk space operation, (B) a deallocate disk space operation, (C) a read from the allocated disk space operation and (D) a write to the allocated disk space operation" [Lomet, col. 5, lines 31-38].

Claim 27 encompasses substantially the same scope of the invention as that of Claim 22, in addition to computer readable medium and some executable instructions for performing the method steps of Claim 22. Therefore, Claim 27 is rejected for the same reasons as stated above with respect to Claim 22.

Claim 28 encompasses substantially the same scope of the invention as that of Claim 22, in addition to a modulated data signal and some executable instructions for performing the method steps of Claim 22. Therefore, Claim 28 is rejected for the same reasons as stated above with respect to Claim 22.

Claims 46, 47, and 50 encompass substantially the same scope of the invention as that of Claims 22, 23, and 26, respectfully, in addition to a serer and some objects for performing the method steps of Claims 22, 23, and 26, respectfully. Therefore, Claims 46, 47, and 50 are rejected for the same reasons as stated above with respect to Claims 22, 23, and 26, respectfully.

Claims 55 and 56 encompass substantially the same scope of the invention as that of Claims 22 and 23, respectfully, in addition to a computing device and some means for performing the method steps of Claims 22 and 23, respectfully. Therefore, Claims 55 and 56 are rejected for the same reasons as stated above with respect to Claims 22 and 23, respectfully. Additionally, Claim 55 recites "wherein said entries from the upper layer are replicated to both said first server and said second server, while said

entries from said allocation layer are stored locally on said first server and said second

server" which is taught by [Lomet, col. 2, lines 50-53 with Lomet, col. 5, lines 51-62 with

Lomet, col. 2, lines 11-16] (similar to the above claims).

21.   Claims 24, 25, 48, and 49 are rejected under 35 U.S.C. 103(a) as being

unpatentable over U.S. Patent No. 5,485,608 (Lomet et al.) in view of U.S. Patent No.

5,434,994 (Shaheen et al.), further in view of Efficient Locking for Concurrent

Operations on B-Trees (Lehman et al.).

For **Claim 24**, Lomet (as modified by Shaheen) teaches: "A method according to

claim 22."

Lomet (as modified by Shaheen) discloses the above limitation but does not

expressly teach: "wherein said data structure is a B-link tree."

With respect to Claim 24, an analogous art, Lehman, teaches: "wherein said data

structure is a B-link tree" [Lehman, p. 657, section 3.3].

It would have been obvious to one of ordinary skill in the art at the time of

invention to combine Lehman with Lomet (as modified by Shaheen) because both

inventions are directed towards storing information in a database.

Lehman's invention would have been expected to successfully work well with

Lomet (as modified by Shaheen)'s invention because both inventions use databases.

Lomet (as modified by Shaheen) discloses methods and an apparatus for updating

information in a computer system using logs and state identifiers comprising Rlogs,

Ulogs and Alogs, however Lomet (as modified by Shaheen) does not expressly disclose

the use of a B-link-tree to store the data in the database of Lomet (as modified by

Shaheen). Lehman discloses efficient locking for concurrent operations on B-trees

comprising a B-link-tree.

It would have been obvious to one of ordinary skill in the art at the time of

invention to take the b-link-tree from Lehman and install it into the invention of Lomet

(as modified by Shaheen), thereby offering the obvious advantage of a guaranteed

small (average) search, insertion, and deletion time for the database of Lomet (as

modified by Shaheen).

Claim 25 can be mapped to Lomet (as modified by Shaheen) as follows: "A

method according to claim 24, wherein the upper layer is a B-link tree layer that handles

B-link tree operations" [Lomet, col. 5, lines 39-44].

Claims 48 and 49 encompass substantially the same scope of the invention as

that of Claims 24 and 25, respectfully, in addition to a server and some objects for

performing the method steps of Claims 24 and 25, respectfully. Therefore, Claims 48

and 49 are rejected for the same reasons as stated above with respect to Claims 24

and 25, respectfully.

Conclusion

22.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brent S. Stace whose telephone number is 571-272-8372 and fax number is 571-273-8372. The examiner can normally be reached on M-F 9am-5:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Apu M. Mofiz can be reached on 571-272-4080. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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